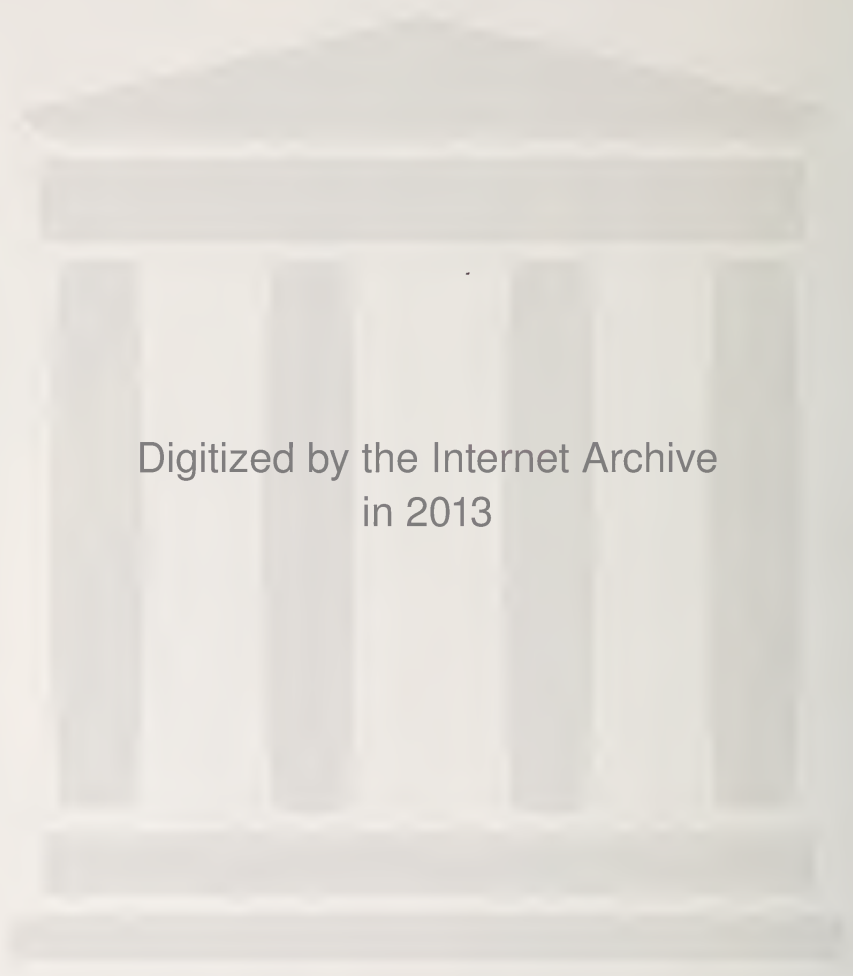




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ONTARIO FISH AND WILDLIFE REVIEW

Vol. 4, No. 2

Summer, 1965



DEPARTMENT OF LANDS AND FORESTS

HON. A. KELSO ROBERTS, Q.C., MINISTER

F.A. MACDOUGALL, DEPUTY MINISTER

ONTARIO FISH AND WILDLIFE REVIEW

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THE COVER

K.M. Andresen's photograph of two youngsters "just fishin' " represents a heritage worth preserving with intelligent conservation practices. The back-cover views of the spiny soft-shelled turtle and its eggs were taken, respectively, by A.F. Helmsley and R.D. Ussher who tells about turtles on Page 6.

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Dog-day Angling

July and August are the peak months for recreational activity in Ontario, but they do, however, present some very real problems for the angler.

By mid-summer, the natural food cycle in our lakes is at its peak and there is an abundance of fish food everywhere. At the same time, following a long lean winter, the fish, themselves, have been feeding ravenously throughout early summer and no longer are they cruising the shoreline in a continual search for food. They tend to spend more time resting on the bottom, and their feeding periods become more clearly defined and occur less frequently.

In southern Ontario, particularly, rapidly warming water in mid-summer causes some fish species to become sluggish. As water temperatures rise, water holds less dissolved oxygen, and yet, fish require more than in cold water. In clear lakes, bright overhead sun penetrates water deeply, and most adult fish avoid such light by inhabiting lower depths or by taking advantage of any natural shade. The growth of aquatic plants is generally at its peak by mid-summer and adds further woe to the average sportsman by increasing the physical difficulty in angling. Warm surface water in lakes and ponds causes trout species to seek cooler depths—and so the problem grows!

To top it all, more inexperienced anglers and family groups occupy the recreational areas in July and August. During this period, fishing is a popular pastime but it has strong competition from such activities as swimming, boating, water skiing, sun-bathing and golf. In many cases, less and less time is being spent in serious angling.

But all is not lost! The fish are still there, and, while good angling tends to be spotty, it simply takes a bit more thought, planning and determination to be successful. "Lone wolf" species such as largemouth bass, pike and muskie remain fairly active during the heat of mid-summer, and some of these are readily available in most areas. For other species, try fishing in early morning or late evening. When in doubt—fish close to the bottom.

KOKANEE SALMON FOR THE GREAT LAKES

by F.P. Maher

Research Supervisor, South Bay Fisheries Research Station

The name "salmon" has a magic quality for both sport and commercial fishermen. The sportsman pictures a superb game fish, famous for its fighting qualities, while the commercial fisherman has visions of a high quality table fish able to command a good price on the market. Since release of the news that the Department of Lands and Forests has begun the introduction of kokanee into the Great Lakes, the possibility that these waters might one day swarm with salmon has captured the public imagination and has led to occasional, wild speculation about the results that might be achieved. While there is good reason to be optimistic about success of the project, there is always the chance of failure when attempts are made to introduce a new species of fish into a body of water, especially one as large and complex as the Great Lakes.

Since the decline of desirable fish stocks in the Great Lakes, measures have been studied to improve the fishery, and the introduction of species of fish new to Ontario (which would be attractive to both recreational and commercial interests) has been explored for some time. Several species of fish were considered in some detail, but attention finally focussed on the kokanee.

The possibility of introducing west coast salmon into the Great Lakes has intrigued fishery workers for many years. To augment the commercial and sport fisheries, chinook salmon were introduced into Lake Erie as far back as 1873. This species was also introduced into Lake Ontario over a four-year period beginning in 1878 and over an additional seven-year period beginning in 1919. Coho salmon were

stocked in Lake Erie in 1933, but the effort was discontinued after one year. None of these introductions were successful. Some of the salmon survived and attained a good size, and spawning runs started in some areas, but numbers declined and the fish disappeared soon after stocking ceased.

Since past experiences with salmon in the Great Lakes have been disappointing, it might be considered overly optimistic to expect any better results from the introduction of yet another species. Of the five species of west coast salmon, the sockeye is the only one which has evolved a race (the kokanee) which perpetuates itself entirely in fresh water. It's this fact which leads us to believe that the kokanee may succeed where other species of salmon have failed.

Many fishermen confuse the west coast salmon with the Atlantic salmon which was once abundant in Lake Ontario. The Atlantic salmon is a close relative of the rainbow trout, while the west coast salmon form a group of their own. One major difference is that all west coast salmon die after spawning, while Atlantic salmon can spawn more than once.

Like the true sockeye salmon, kokanee spawn in streams and on lake shores in fall and early winter. The young fish emerge from gravel spawning grounds in early spring and migrate into open water of lakes, where they move in schools well below the surface. Here, they feed on plankton, minute plants and animals in the water. After three or four years, the fish mature and spawn, usually moving back to the lake and dying shortly afterwards.

Another common name for the kok-



Yearling kokanee salmon in display tank. Photo by W. Masters.

anee is "little redfish"; the reason for this is apparent at spawning time when they lose their silvery appearance and turn red. The head, however, at this time becomes green. Except when kokanee are spawning, most fishermen could confuse this fish with the rainbow trout because of its trout-like, silvery appearance.

The kokanee has many qualities which would make it attractive to Ontario fishermen. It is a fine table fish, excellent either fresh or smoked. If suitable spawning areas are available, the fish is usually present in large numbers, and catches of 30 or more are not uncommon. In British Columbia, there is no closed season or bag limit for these fish because of their abundance, and limits in nearby states are generous.

Kokanee prefer cool water from 10 to 40 feet below the surface in open, deep areas of lakes. Trolling for them can produce excellent results, particularly when a school has been located. The fish will take a variety of lures, but possibly the most effective lure used out west is a worm-baited hook, trolled behind several willow leaf spinners, or gang troll. Still fishing with

worms or single salmon eggs is effective, and they can be taken on flies in cooler weather when the fish move near the surface.

It is not known how large kokanee will grow in the Great Lakes. In their native habitat, these fish are often only eight inches in length at maturity, but the same stock planted in more productive waters has attained lengths of 18 inches or more. Hopes are high that in Ontario the fish will attain a size of at least fifteen inches.

Through the co-operation of the Province of British Columbia, 1,500,000 kokanee eggs from a stream-spawning stock arrived in Ontario in November, 1964, from the Meadow Creek egg collecting station. Half of these eggs were sent to the Fisheries Research Station at Glenora, near Picton, for planting in Lake Ontario and its tributaries, and the other half was sent to the Chatsworth hatchery, near Owen Sound, for Lake Huron plantings. Of these eggs, about half were planted as eyed eggs in suitable streams, tributary to Lake Ontario, and in streams of the Bruce Peninsula, Georgian Bay and Manitoulin Island. The rest of the fish were raised to the fry stage and planted early this



Thousands of spawning kokanee salmon, concentrated below the egg collecting trap in Meadow Creek, B.C. Photo by W.J. Christie.

spring in suitable areas of the lakes.

A total of 1,750,000 kokanee eggs of shore-spawning stocks was also obtained from the states of Colorado, Montana and Washington. Once again, some were planted as eyed eggs while the majority were raised to the fry stage and planted in areas which appeared to be suitable as shore spawning sites. Kokanee have a well developed "homing" behaviour and tend to return as adult spawners to the areas in which they were planted as eggs or fry. It is hoped that, by planting what appear to be good stream and shore spawning areas with eggs and fry, that the fish will return to these areas as adults, and that natural propagation will follow.

The kokanee usually has a life span of three or four years, so it is planned to continue the planting pro-

gram for at least four years. The Fisheries Research Stations at South Bay, on Manitoulin Island, and Glenora, on Lake Ontario, will follow the success of the first experimental plantings. Depending on the results obtained, consideration can then be given to extending or dropping the program.

Although the kokanee has an impressive list of qualifications for success in the Great Lakes, optimism about its future must be tempered with caution. It should occupy portions of the lakes not frequented by desirable species now present, and it might be able to compete successfully with alewives and smelt. It is capable of spawning in a variety of locations and will likely be able to find some areas suitable for spawning so that natural propagation



Kokanee salmon just before losing their silvery appearance and assuming the red coloration of spawning time. Photo by W.J. Christie.

can take place. It will likely attain a worthwhile size from the point of view of the angler, and become abundant enough to permit exploitation by commercial fishermen. Its probable size at maturity and its habitat requirements indicate that it should be able to escape major predation by lampreys. With all of these obvious advantages, what could go wrong?

In answer, it should be pointed out that nowhere in its native range does it occupy lakes as large as the Great Lakes, and there might be something in the nature of such large lakes that is detrimental to the kokanee. Even if the introduction is successful, it might take a great many years before the kokanee is abundant enough to provide good fishing because of the immense size of the waters to be populated. Then, too,

in its native waters, the kokanee has to live with less than 70 other species of fish, while there are well over two hundred species in Ontario. It is possible that some species of fish now present in Ontario might compete with kokanee for food, or live off them directly, preventing the development of large populations. Possibly the biggest danger is that our waters are colder for a longer period of the year than western waters, and this fact might inhibit successful spawning or cause serious egg or fry losses.

Considering all of the arguments for and against, the introduction of the kokanee is worth trying. At worst, we will have lost very little, and at best, we might provide a sport and commercial fishery of great economic benefit to the Province.

TURTLES OF ONTARIO

By R.D. Ussher

Park Naturalist, Rondeau Provincial Park

Turtles, like other reptiles, are cold-blooded vertebrates. Our native forms in Ontario are neither purely aquatic nor entirely terrestrial. Their mode of life is amphibious and, while all are born on land, most of them promptly take to the water and may spend most of their lives there.

Turtles are easily recognized; their appearance and movements distinguish them at once from either lizards or snakes, the other reptiles found in the Province.

The body is enclosed between bony shields, the carapace above and plastron below, these being joined by a bridge on either side. In the Soft-shelled Turtle, the carapace is smooth and leathery with flexible margins. In all the rest, the upper shell is comprised of horny plates or scutes, and the whole is rigid.

The limbs are more or less scaly and the toes are webbed and provided with nails which may be quite long and sharp. As might be expected, the webbing is most developed in the primarily aquatic species like the Snapping and Soft-shelled Turtles.

The jaws lack teeth but have sharp cutting edges; the lower jaw fits inside the upper, resulting in a shearing action. A painful wound may result from careless handling of these two turtles. The smaller turtles, however, seldom attempt to bite when picked up, although the Musk Turtle may do so.

Turtles have moveable eyelids and so lack the glassy stare of snakes. Ear openings are covered externally by a membrane. "Hearing" would appear to be the sensing of vibrations, and most species appear alert to any disturbance.

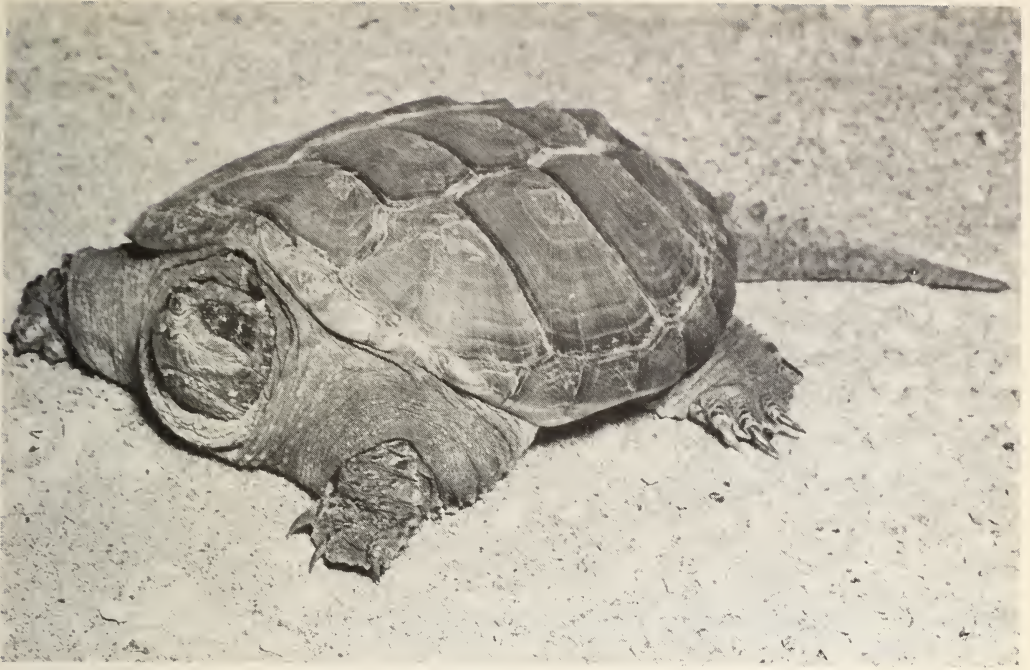
In addition, turtles have keen eyesight.

The head and neck are retractible. The Blanding's and Musk turtles have semi-hinged plastrons that enable them to partly close the fore-part of the plastron against the carapace, giving additional protection. This closing is more complete in box turtles, native in the United States.

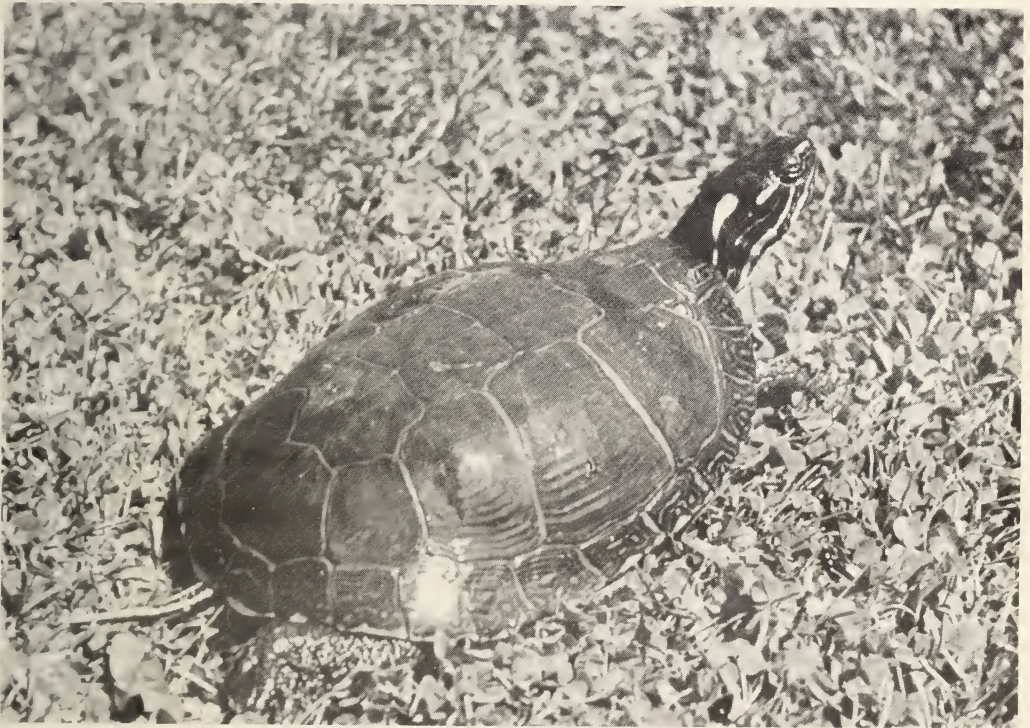
The sex of turtles may be determined by the plastron. In females it is convex and in male turtles it is slightly concave. The vent in females is near the base of the tail; in the male turtle it is more posteriorly located. The vent in Soft-shelled Turtles, however, is near the tip of the tail in both male and female.

Turtles, like most reptiles, lay eggs which are fertilized inside the body of the female. She excavates a nest-hole in the ground, into which the eggs are laid directly, being arranged by some species with the hind feet. The cavity is then filled in and may be smoothed over by the female as a last gesture. She takes no further interest in her offspring, and their hatching depends to a large extent upon weather conditions. Turtle eggs are of prime interest as food to skunks and raccoons, among other potential enemies.

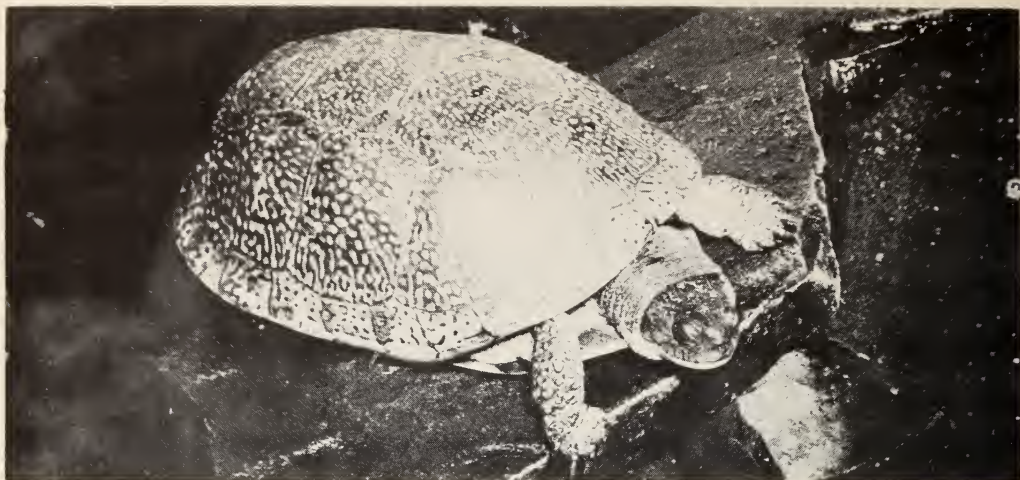
June is the usual month for egg laying, with hatching in late summer, early fall or possibly not until next spring. Fall-hatched young may hibernate in the ground. Map Turtles were found hatching at Rondeau Park shortly before the ground froze. Bleakney suggests that such hatchlings, too weak to dig deeper into the soil, may survive because of their yolk reserve which lowers the freezing point of their tis-



Snapping turtle. Staff photo.



Painted turtle. Photo by R.D. Ussher.



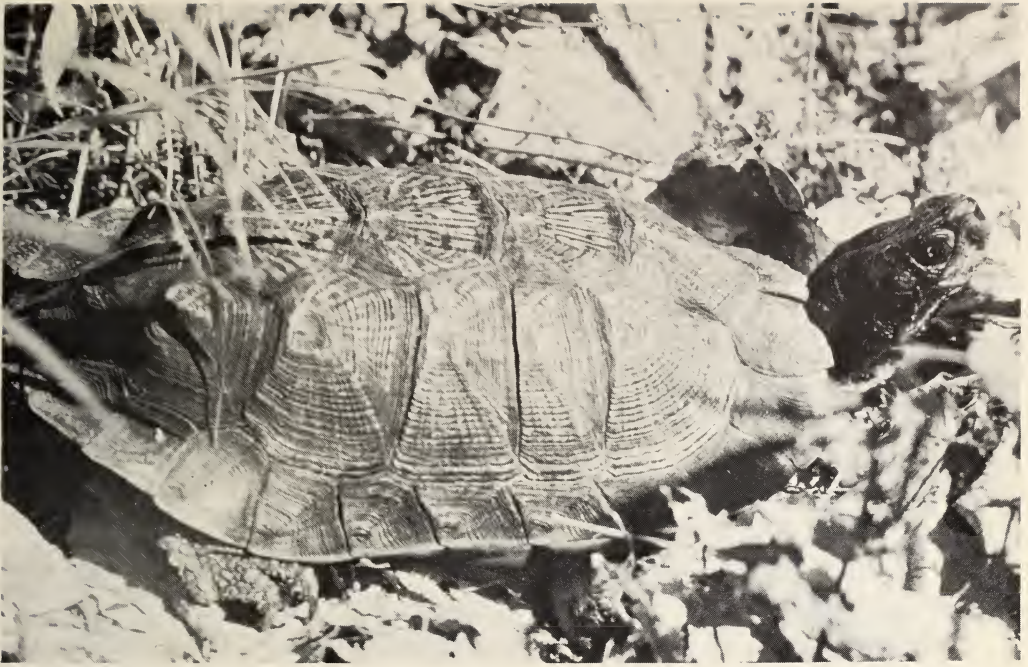
Blanding's turtle. Staff photo.



Map turtle. Note keeled carapace. Photo by R.D. Ussher.



Spotted turtle. Photo by R.D. Ussher.



Wood turtle. Photo by R.D. Ussher.

sues beyond that of adults of the same species.

Turtles are omnivorous, eating plant as well as animal food, both dead and alive. They are useful as scavengers—seldom altogether harmful—and most likely to be neutral to man's interests. They form an interesting, though not too well known, group of native animals.

In Ontario, eight species of turtles are known; one, the Painted Turtle, is represented by two subspecies.

Ontario has two large turtles, attaining a carapace length of more than a foot, both laying round eggs.

The Snapping Turtle may reach 16 inches, has a dull brown carapace, which is coarsely notched behind, and small plastron. The tail is long with a row of large tubercles above; the head is large. This turtle is mostly aquatic, and capable of a dangerous bite. Found

north to Sudbury, Port Arthur and Lake-of-the-Woods.

Spiny Soft-shelled Turtles grow to 14 inches in carapace length. They are rather flat, smooth and leathery above, with flexible shell-margins and no plates or scutes. Ground colour, olive to grey, with darker markings. The plastron is very small. The neck is long, with a slender pointed head. They are very aquatic, swift and agile, and should be handled with caution. Found along Lake Erie, Lake St. Clair, the Thames River valley, north to Dundas.

Two native turtles are medium in size, and they, like the small species, lay elliptical eggs.

Blanding's Turtle has a carapace dark, smooth, rather domed and speckled with yellow; the shell may be 10 inches long. There is a hinge in the plastron; the chin and throat are bright yellow.

This is a gentle species, spending much time on land. It ranges north to North Bay and Manitoulin Island.

The Map Turtle's northern limits are Muskoka, southern Frontenac and Ottawa. The carapace is smooth and keeled, up to 11 inches long, marked with fine, irregular greenish-yellow lines. There are similar markings on the head (which is quite large in females) and on the neck and limbs and a yellowish spot behind the eye. A very wary turtle, fond of sun basking; mostly aquatic.

The remaining species are all small in length of shell.

Musk Turtles are seldom noticed. They are aquatic, secretive and active at night. Rarely over five inches long, they emit a musky odour when annoyed and may bite. The carapace is smooth and dark, the plastron small and hinged. The head is large, with two yellowish lines above and below the eye. Found in Ontario southwest of a line from about Kingston to the mouth of the French River.

Wood Turtles may reach eight inches or smaller in length. The carapace has the scutes grooved and with

dark markings. There is orange on the neck and limbs. It is mainly terrestrial, alert and active. Found north to Sault Ste. Marie, Muskoka and Algonquin Park.

Spotted Turtles are usually four inches or smaller in length. The carapace is marked with scattered yellow or orange spots, as are the head and limbs. The throat is marked with orange, with more on the underside of the limbs. This little turtle spends a good deal of time out of the water. It occurs southwest of a line from Toronto to Lake Simcoe and western Parry Sound District.

Midland Painted Turtle is a common species in the south, and is known as far north as Biscotasing and Lake Timagami. The carapace, with brilliant red on the margins, may be six inches long; there are red and yellow markings on the head and neck; the limbs and tail show red stripes. The plastron is yellow or pinkish, with a dark central blotch. Very fond of sun bathing, mostly aquatic and very alert to danger.

Western Painted Turtles replace the Midland subspecies northwest of Lake Superior. This race is larger, with less of the red, and the dark on the plastron extends outward between the scutes.

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TRESPASS AND THE JACK RABBIT

By J.S. "Sandy" Ellis

Assistant Senior Conservation Officer, Lake Simcoe Forest District

It is now more than five decades since the European hare or "Jack Rabbit" was accidentally introduced into southern Ontario. Since it has become established, this hare has not encountered a serious cyclical set-back, but has increased gradually. There seems to be no logical grounds in the foreseeable future why it will not prosper and remain in these parts. This unpredictable jackass of the *Lepus* family is certainly a controversial mammal but we personally admire him and wish him luck.

Never before has an animal caused so much concern as this imported European hare. Standard management and hunting practices, which were considered as the *status quo* for many years, have been constantly revised to keep pace with him. These new concepts have changed the thoughts of firearm and ammunition manufacturers; they have altered the training procedure of trail hounds and have created the need to adjust certain long-standing regulations in the Game Laws.

The buffalo of the plains was not equipped to withstand the advance of the settler and his demise was short when he dared to compete for grazing privileges. The fenced enclosure and conspicuous, easy target marked the end. Not so with our Ontario jack rabbit! He observes no boundary line, and any enclosures or obstructions are but a challenge to him. A bountiful supply of growing grain, vegetables, succulent grasses and varied plants are generally available in some part of his domain. With climate to his

liking, plenty of safe cover and laws to protect him during the spring and summer — what more could he ask?

His colouring is a natural camouflage, which he uses to advantage, and his long legs can take him out of reach of predators at 40 m.p.h. or better. Using the daylight hours to loaf and rest, he is nocturnal by habit, roaming at will during the night when prohibition of firearms is in force and the farmer is snugly in his bed.

If the jack rabbit has a weakness, it is his confidence in his own ability to survive and outwit his enemies. He appears to treat his pursuers with utter disdain and contempt, and it is this characteristic that eventually ends his career. Although the jack rabbit is adept at covering his trail and marking the location and approach of all his pursuers, he never gives heed to what lies ahead and runs into hidden ambushes from which there is no escape. At other times, he will lie immobile in the open, confident of his camouflage, only to take off after losing his nerve well within gun range.

When the European hare first became established in Brant County, his introduction was welcomed by the sportsmen and the farmer and he was allowed several years to increase before being hunted. The result was a boon to the hunter and a disaster for the farmer. Young orchards and berry canes and newly planted seedling trees were girdled and destroyed.

The old method of hunting only in swamps and thickets for rabbits of

the snowshoe and cottontail variety had to be revised to hunting across open fields and crop lands. Unable to contain the jack rabbit and his subsequent damage to tender plants, invitations were sent to hunters by farmers to participate in rabbit drives. It was soon learned that this large hare required more power in ammunition and gun range. The old reliable double barrel of Damascus steel which was fine for snowshoe, grouse and cottontail became obsolete for the jack rabbit. This caused a swing to repeating shot-guns and to #2 rather than #5 shot.

The reputation of the hare as a meat animal, game animal and a source of a new, exciting, outdoors recreation, placed many more hunters in the field. With this rising activity came the indignation of many land owners who resented this intrusion without permission. Gradually the "No Trespass" sign became a common sight.

So we still have the jack rabbit with us and possibly a few leaps ahead of us: a tantalizing miscreant to some — a great sporting animal to

others. The total elimination of the jack rabbit (which is highly improbable) would cause a great void for the small game hunter who enjoys this week-end sport. It would also reduce the revenue from the sale of hunting licences. It has been necessary to make many revisions to keep pace with the presence and habits of this hare. Rabbit drives have been limited to 12 hunters; a closed season from spring to fall to reduce hunters in the field has been instituted; and stiffer penalties for trespass on private lands have been recommended.

The key to mutual understanding and good will between the farmer and hunter is a continual program of sportsman education. Through Departmental publicity, personal contacts and through the work of sportsmen's organizations, the bonds of hunter-farmer relations are being cemented. A courteous request for permission to hunt is seldom refused by a landowner! Invite the land owner to accompany you and share your game. Don't be a jack rabbit! He doesn't give a darn for anything.



A young white pelican, just hatched. Photo by T.A. Humberstone

THE WHITE PELICAN IN ONTARIO, 1964

By T.A. Humberstone

Conservation Officer, Kenora Forest District

Between 1957 and 1959, conservation officers in Kenora District received reports that a colony of white pelicans (*Pelecanus erythrorhynchos*) was nesting on the Lake of the Woods. Upon investigation, it was learned that the nesting site was somewhere in the southwest portion of the lake, approximately 45 miles from Kenora and in the same general area where an earlier nesting colony was known to have existed prior to the last war. Although the white pelican is common to Manitoba and Saskatchewan, the only known nesting site in Ontario is located on Lake of the Woods.

On September 4, 1960, a summer resident of the area escorted M. Linklater and R. Hall to two small, unnamed islands about two miles south of Massacre Island. There, the officers observed fifty adult pelicans and eight young. Both islands are very rocky with a total land area of approximately three acres. Vegetation consists of sparse patches of coarse grass as well as numerous dead bur oak trees. Other birds species inhabiting the islands are double-crested cormorants, herring gulls, common terns and a few spotted sandpipers.

The white pelican (as the name implies) is a large, stately white bird with black wing tips. The webbed feet and pouched bill are of a light orange colour. An adult pelican may weigh up to twenty pounds and has a wing span of nine feet. A specimen forwarded to the Royal Ontario Museum by the author in 1963 weighed 10 lbs.,

3 oz. An adult female taken during the summer of 1964 weighed 13 lbs., 4 oz.

The pelican is a silent bird except for an occasional "grunt" heard when flying overhead. On land, it walks with a very upright, majestic air but appears clumsy and confused when taking off. Once in flight, this clumsiness is not apparent, and few birds are more graceful. With the head held back, they glide along effortlessly, occasionally flapping their wings for momentum.

In June, 1938, Philip Smith, a commercial fisherman, reported that a small colony of pelicans nested on the larger of the two islands (previously referred to) and had laid sixteen eggs. Baillie published a paper mentioning pelican nests on Dream Island, Lake of the Woods, which is located about one-quarter of a mile north of the present nesting site, and it is quite possible that his sightings refer to the present locations.

It has been learned that, during the 1930's, the pelicans and cormorants on Lake of the Woods were persecuted by commercial fishermen who believed that these two species, especially the pelicans, devoured great quantities of commercial fish. It is reported that the fishermen would visit the nesting site in the spring and endeavour to eliminate reproduction of these species by shooting the adult birds. The pelicans then apparently disappeared from the lake and it has not been until the recent rediscovery that any known

sightings were made. It is estimated by the author that the present colony is made up of approximately 500 adult birds.

In 1960, Massacre Island was declared a Wilderness Area to provide additional protection for this bird.

BEHAVIOUR

Pelicans return to the nesting site very early in the spring. A commercial fisherman, William King, reported in 1963 that he observed thirty pelicans present on April 14. The lake was still ice-covered on that date. On May 11, 1962, the author observed the islands from the air and estimated 300 birds to be present. The lake was still ice-covered at this time with the exception of a ring of open water adjacent to the shoreline of the islands.

The actual nesting takes place soon after arrival from the wintering grounds. The nest is merely a slight depression scratched out in the shallow soil with debris pushed up around the eggs, forming a rim. Eggs were observed hatching on June 1, 1962. With an incubation period of 29 days (Murphy, 1961) this would indicate that the eggs were laid on or about May 3rd. Pelicans and cormorants are apparently compatible as many of their nests are built within a foot or two of each other.

During the mating period, both sexes develop a half-moon shaped, horny structure about two inches high and three inches in length along the upper bill. This peculiar protuberance to the bill is shed after the eggs have been deposited and incubation is in progress.

The female normally lays two eggs that are a dull white colour. The eggs are ovate to elongate-ovate in shape

and measure approximately 90 x 56.5mm. (Bent, 1922). Eggs measured by the author last spring were as follows: (1) 8.98 x 5.41 cm.; (2) 8.50 x 5.55 cm.; (3) 9.33 x 6.07 cm. and (4) 9.02 x 6.02 cm. The majority of nests contained two eggs but the number varied from one to three. Both sexes share the chore of incubation.

The young emerge from the shell naked, blind and helpless and are a livid flesh colour. They were observed on the nests being fed by the parents. The adults regurgitate the food with the head bent downwards. The young reach up and delve into the pouch to secure their food. As the young grow larger, they reach deeper into the pouch and are reluctant to withdraw. The parent is usually forced to break the relationship by shaking its head from side to side.

By the time they are three weeks old, they are approximately one-third grown and are covered in downy white feathers. Up to this age, they seem unafraid and sit "cracking" their bills at any approach. Then, they begin to wander from the nest and congregate with the other young in the vicinity. Swimming comes naturally to the young and at the first indication of any danger they head for the water and swim in a compact group often as far as a quarter-mile from the nesting site.

They are abandoned by their parents before they learn to fly. Until they learn to forage for themselves, they must live on their own body fat.

FEEDING

Pelicans feed in groups in shallow bays and weedy areas. Unlike the brown pelican (*Pelecanus occidentalis*),



Main nesting island (foreground) of white pelicans in Lake of the Woods. Double-crested cormorants and herring gulls are also seen. Photo by T.A. Humberstone.



White pelicans at the age of two weeks. Photo by T.A. Humberstone.



*G.F. Coyne, District Forester (Kenora), with white pelicans about four weeks old.
Photo by T.A. Humberstone.*

the white pelican never dives but rather wades or swims in company, thrusting the head beneath the surface to scoop up its prey. They take large numbers of small fish, and it is said an adult can consume one-third of its own weight in a single forage. Contrary to popular belief, the pelican does not store food

in its pouch but swallows the fish which it later regurgitates.

The author identified food species after inducing two young birds to regurgitate. The young in the nest invariably vomit when handled to any extent. Fish species identified after being disgorged included:

Ciscoe	4	Burbot	1
Bass	1	Sunfish	8
Bullhead	7	Snail	1
Perch	9	Crayfish	2
Walleye	4		

In addition, the following animal bones were found:

2 Long Bones of Deer

1 Beaver Skull

4 Long Bones of Rabbit

These observations seem to indicate that pelicans consume few game fish. Their diet appears to consist mainly of coarse fish and, perhaps, a small amount of carrion.

BANDING

During the early part of 1964, a banding licence was obtained from the Canadian Wildlife Service. On June 30, W. Charlton, W. Dan Mansell and the author visited the islands and banded a total of 68 young birds on the larger island. These birds were between three and four weeks old. It was found that at this age (when the young start to enter the water) that they are easily captured.

Trouble was experienced in attempting to sex each bird using the cloacal technique. After several unsuccessful attempts, it was decided to forego this part of the banding program as extensive handling appeared to have adverse effects on the birds.

It is hoped that returns from recoveries of banded birds will supply

the following information:

1. Local movements of this colony.
2. Wintering grounds and migration routes of the colony.
3. Whether or not the young return to this Ontario nesting ground.

An increased effort will be made to estimate the total population of this colony. It is difficult to conduct an accurate count as the birds travel great distances to secure food and, as a result, flocks of pelicans are coming and going from the islands at all times of the day. It is estimated that during the period, 1960-1963, the colony consisted of approximately 500 adult birds. During 1964, however, it was felt that there were fewer birds present than in previous years. Counts made during several visits to the islands indicated no more than approximately 175 birds present. This low count was also evident in the hatch of young birds this spring. A total of only 68 young, compared to 204 in 1963, reached the swimming stage by mid-summer. It was noted that the southwest corner of the larger island, usually the most popular nesting site, was completely void of nests last spring.

It is the author's opinion that, with increased boat travel in recent years, the pelican may be a vanishing species in the Lake of the Woods area. However, population estimates and nest counts next year will give us more information on this subject.

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PISCATORIAL MIDWIFERY, ITS USES AND ABUSES

By R.E. Whitfield

Fish and Wildlife Supervisor, Tweed Forest District

It is interesting to note how frequently the Department is requested to strip the eggs from female game fish, take them to the hatchery and, after holding them briefly, return them to the various lakes and streams of the district.

Obviously, many believe our game fish lapse into a state of inadequacy at the time of spawning, and feel that these poor creatures need the help of local fish culturists to take away their eggs and milt and rear the young in the sanctity of hatchery incubation jars.

What about this piscatorial midwifery practised widely since the turn of the century by government fish culturists? How did this practice get its start?

It came about through the efforts of early fish culturists in the late 1800's in Ontario. These pioneers, no doubt, must have marvelled somewhat at their own accomplishments in that they succeeded in stripping eggs from female fish and milt from the males — mixed these together and came up with fertile eggs that would later hatch into young fish.

These early, earthy scientists who experimented with the intimate life of the fish probably had no idea how public interest would grow in this direction, but were to find later that taking eggs from fish, artificially fertilizing them and incubating them in hatcheries became widely accepted by many as a cure-all to fishing ills. Environmental conditions in lakes, good or bad, made little difference so long as

the psychological effect was achieved.

Certainly, many refinements have been added to fish culture over the years. Aside from this, a large-scale follow-up of fish plantings has been carried out by the Department. This naturally resulted in the amassing of a great deal of information pertaining to the suitability of lakes and streams for fish.

Lake survey data, on hand, now enable fisheries workers to stock hatchery-reared fish in more appropriate waters with increased efficiency and accuracy, resulting in better angling in many cases.

Walleye, for instance, because of their prolific nature (females producing from 26,000 to 36,000 eggs per pound of their body weight) are quite capable of maintaining themselves under most circumstances without any help whatsoever from fish culturists and hatcheries. In fact, these fish produce in one year many millions, if not billions, of eggs and young fry over and above what most of our walleye lakes are capable of supporting.

Because of characteristics of a "built in" nature in these fish, they are much more capable than mankind in seeking out suitable shoals in lakes and rapids in rivers on which to deposit their eggs, and where the young fry are most likely to find sufficient food for survival.

It has long been known that man's efforts to duplicate the natural habits and instincts of fish by artificial means



Removing eggs from lake trout, Sault Ste. Marie District. Staff photo.

has (at least, in the warm water species) been quite inadequate and has contributed little to the betterment of angling, except in cases of successful introductions to new waters.

The problem that exists in our warm water sport fisheries is not attributed to the inadequacy of these fish at the time of spawning. They are quite adept at congregating on their natural spawning grounds and depositing their eggs, as both conservation officers and walleye poachers can well verify.

It is after the eggs are deposited

and fertilized that the most serious problems are likely to set in, causing periodic peaks and declines in the abundance of this species.

Failures in egg and fry survival of walleye and other warm water fish are not wholly understood, but there is some evidence that weather and water temperatures during the early stages of the life of these fishes may be a major factor that determines whether a large or small year-class of fish will result. Matters are further complicated by the fact that it is difficult, if not impossible, to predict an oncoming failure

in a year-class of fish so that measures can be taken beforehand to offset this failure by stocking eggs or fry from hatcheries in the same year the failure occurs.

Another limiting factor is the necessary sharing of the environment of the lake with other fish of the game and non-game species. Some warm water fish lakes contain ten to twelve different species of fish, some of which are piscivorous (fish eating). Out of the ten to twelve species occupying the lake environment, possibly only two or three species are game fish. Every fish in the lake, regardless of species, occupies space and competes in some manner with other fish for food and generally contributes to taxing the lake to its limit in fish carrying capacity. Lakes, in accordance with their productive capacities, will only carry a given number of pounds of fish. When this limit is reached, the placing of additional fish in these lakes from hatcheries can be likened to pouring water in a bucket that is already full.

Technical advances in the field of fisheries research have shed some light on partial control of coarse, unwanted fish in large warm water lakes that may well contribute to a better balance of fish populations in favour of the sport fishes.

Cold water fishes such as brook (speckled), rainbow and brown trout fall into a somewhat different category as far as lake conditions and management are concerned. These fish have been introduced widely from hatcheries into lakes that do not contain warm water game fish species or coarse fish.

Many of the "trout lakes" were created originally through the intro-

duction of hatchery-reared fish. These lakes, for the greater part, are not natural trout waters and frequently lack adequate spawning facilities.

Lakes of this nature may best be described as rearing basins where hatchery-planted fish are provided with space and natural food that enable them to live and grow until such time as they can be caught by anglers. These waters are managed on a modified put-and-take basis. Little, if any, natural reproduction occurs; therefore, it is necessary that they be maintained by the use of hatchery stock.

Many, otherwise idle, lakes have been put to use through introductions and repeated plantings of hatchery-reared trout. This fishery now has reached sizeable proportions and supports a large segment of the trout angling fraternity.

In comparison, lake trout plantings made annually in district waters are by no means the sole support of the lake trout fishery. Natural reproduction plays a major part in our lake trout lakes in producing annual crops of these fish. Hatchery plantings are merely a supplement to natural reproduction.

Too often, fish plantings from hatcheries (especially the warm water species such as walleye, bass and maskinonge) are looked upon as the most important means of producing better fishing, with little thought given to the conditions existent in the lakes for which fish are requested for stocking. A continuing program of data collection on district lakes will eventually result in better and more effective use of hatchery-reared fish and take much of the guesswork out of stocking.



Measuring the oxygen content of water in lake. Photo by W. Masters.



Rearing troughs at Chatsworth Trout Rearing Station. Photo by T. Jenkins.



